Weekly Report

Period: 2016/6/27-2016/7/03
Reporter: Li Zongzhuang

A Five-Level Design Framework for Bicluster Visualizations

(from TVCG 2014 ,Author Maoyuan Sun and so on)

In this paper, it presents a five-level design framework for bicluster visualizations.
And it has a survey about the state-of-the-art design considerations and applications. It has very useful interactions for users.

Levels	Explanation	Task
Entity	between two individual entities	Discriminate, Mark,Show
Group	between one individual entity and a group of entities	Show
Bicluster	between two groups of entities	Find
Chain	multiple biclusters	Correlate
Schema	database-like patterns in a dataset	

Matches, Mismatches, and Methods: Multiple-View Workflows for Energy Portfolio Analysis

(Author Tamara and so on)

The main contribution of this paper is a methodological advice for visualization design projects, which includes considerations for designing workflows that incorporate multiple views.

This energy analysis workflow can also be reflected in the task abstractions including overview, drill down and roll up.

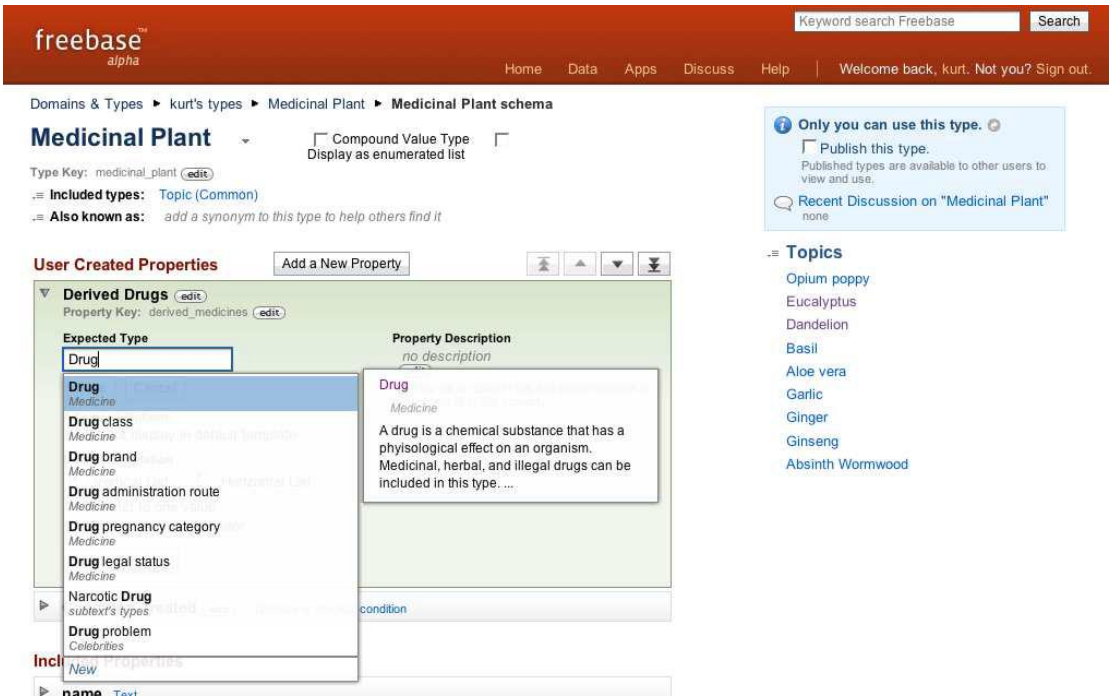
But infact, visualization layouts and encodings don't have any intentions.

Freebase: A Collaboratively Created Graph Database For Structuring Human Knowledge (**Author** Kurt Bollacker and so on)

Freebase is a practical, scalable tuple database used to structure general human knowledge.

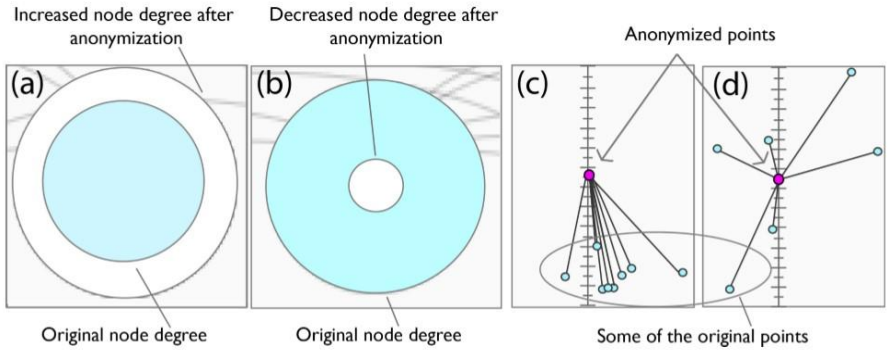
The data in Freebase is collaboratively created, structured, and maintained.

The key components of Freebase are: A scalable Tuple Store, An HTTP/JSON-Based API, A Lightweight, Collaborative Typing System, A Large, Diverse Data Set, A Philosophy of\Complete Normalization".



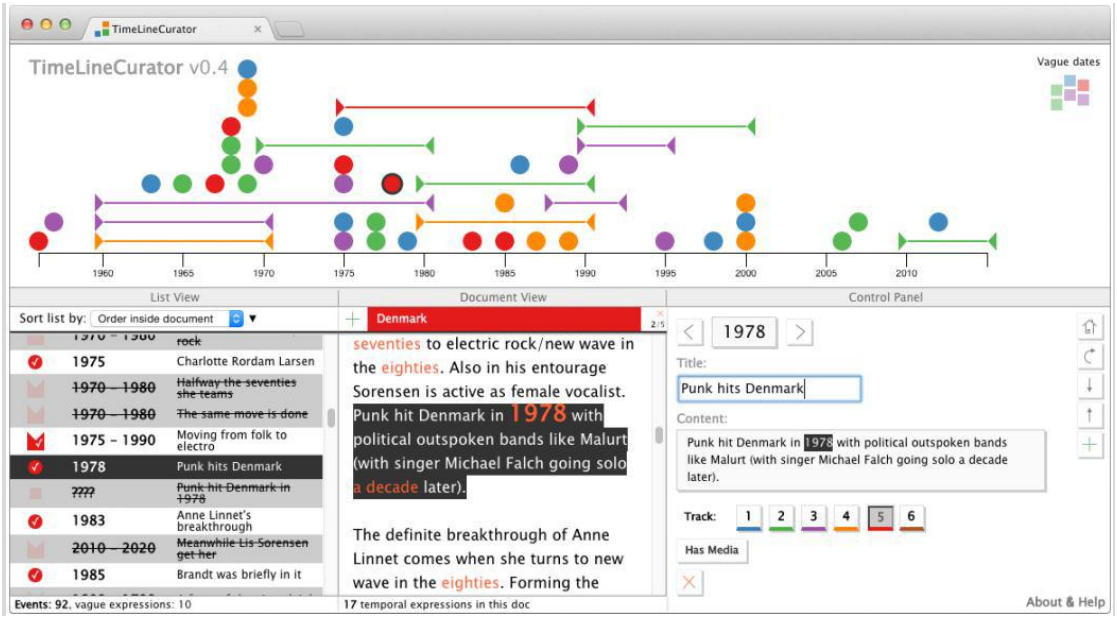
Using Visualization to Explore Original and Anonymized LBSN Data (from EuroVis 2016)

GSUVis is a visual analytic tool to help experts better understand the effects of anonymization.



A variation of graph anonymizer approach (add or delete edges for graph anonymization) and a location anonymizer (based on k-anonymity) are implemented to achieve the goal.
Comparing with RelationLine, GSUVis uses node-link diagram rather than real map to avoid involving privacy. However, their system can hardly considerate POI information and specific trajectory patterns.

TimeLineCurator: Interactive Authoring of Visual Timelines from Unstructured Text (fromTVCG 2016, Author Johanna Fulda and so on)



TimeLineCurator, a browser-based authoring tool. The extracting, formatting and showing processes are automated. Those events that happen in a single date, span with a beginning date and an end date and don't have a specific date (placed in the top-right corner) are encoded in different ways. From the perspective of both design and application, the entire system is concise and practical.

附录：

Knowledge Graph and Visualization

Li Zongzhuang

Abstract：The Knowledge Graph is a knowledge base used by Google to enhance its search engine's search results with semantic-search information gathered from a wide variety of sources. The Knowledge Graph uses the power of semantics, and wants to improve search precision and effectiveness by building the semantic web. Visualization is the study of (interactive) visual representations of abstract data to reinforce human cognition. The visualization of Knowledge Graph can Effectively improve the efficiency of the user to complete the search target and precision. Data integration and correlation analysis reasoning is one of the best visual analysis applications. At this time, There are many applications have been exploited based on this concept.

1. Introduction

Knowledge Graph display was added to Google's search engine in 2012. Once a user search one thing, it provides structured and detailed information about the topic in addition to a list of links to other sites. According to Google, the information in the Knowledge Graph is derived from many sources, including the CIA World Factbook, Wikidata, and Wikipedia.

In 2014, Google announced a new initiative,called the Knowledge Vault, which derives much

of its data from the Knowledge Graph and the sources thereof, as well as harvesting its own data, ranking its reliability and compiling all results into a database of over 1.6 billion facts collected by machine learning algorithms.

Vision is the most important channels to the information of the outside world. Visualization is the data technology of interactive visual expression. On the century of big data, The ability of processing data is far behind the ability to get the data. The amount of data contained in Knowledge Graph is huge, so the visualization can be an important means of Knowledge Graph data processing. It can help us find the phenomena and laws faster and achieve the goal. However, the research about the visualization of Knowledge Graph is relatively shallow.

2. Knowledge Graph

2.1 Related techniques

There are many related techniques to Knowledge Graph technology. Such as DBpedia, Freebase, Knowledge Vault and so on, some of them are the occasion of Knowledge Graph appeared, some of them are the development of Knowledge Graph.

2.2 Semantic Web

The core concept of Knowledge is the introduction of the semantic, which means that let the computers know the semantic judgments.

3. Visualization

3.1 Graph data visualization

Graph data is an important component in data. The visualizations about graph data are often presented by node-link graph.

3.2 High-dimensional data visualization

There are many data sets have more than one dimension. So many visualization tools have been invented to present high-dimensional data. The results got by Knowledge Graph often have many properties. That means we can get some revelation.

3.3 Another types visualization

Because of the difference of goals, there can be many visualization schemes. Maybe we can learn more from them.

4. Application softwares

Based on the theory of human-computer interaction, there are a lot of software is put forward based on the semantic web. This kind of software focus on data integration and correlation analysis. Data integration made in background automatically, and data correlation analysis mainly rely on people's reasoning ability as well as front end some interactions. That’s the best application, which give full play to the people the calculation of analytical reasoning skills and computer specialty.

There are many applications in this area, such palantir, IBM i2, Tableau and so on.